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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/311,480	05/13/99	LEE W	D-17965

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EXAMINER	
KRUER,K	
ART UNIT	**PAPER NUMBER**
1773	8

DATE MAILED: 10/10/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	Applicant(s)
09/311,480	Lee et al.
Examiner	**Art Unit**
Kevin Kruer	1773

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *May 7, 2001* .

2a) ☒ This action is **FINAL.** 2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-10* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☐ Notice of References Cited (PTO-892)
16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____
18) ☐ Interview Summary (PTO-413) Paper No(s). _____
19) ☐ Notice of Informal Patent Application (PTO-152)
20) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admissions in view of Nahass et al. (Pat. No. 5,591,382). Applicant admits that a typical electrical power cable generally comprises one or more conductors in a cable core that is surrounded by several layers of polymeric materials. Those layers include a first semiconducting shield layer, an insulating layer, a second semiconducting shield layer, a metallic tape or wire shield and a protective jacket. Typical strippable shield compositions contain a polyolefin, such as ethylene/vinyl acetate (EVA) with a high vinyl acetate content, conductive carbon black, and organic peroxide crosslinking agents. Carbon black is usually included in amounts of about 20 to about 60 percent by weight based upon the weight of the composition. Nitrile rubber may be added for the purpose of reducing the composition's strip force (see pages 1 and 2 of the specification).

Applicant does not admit that carbon fibrils (a.k.a. nanotubes) are commonly added to semiconducting shield compositions. However, Nahass teaches that carbon fibrils have been used in place of carbon black in conductive compositions. Compared to carbon black, less carbon fibril is necessary to reach the desired conductivity. Furthermore, a polymer's tensile and flexural

characteristics are enhanced when carbon fibrils are added (col 1, line 54- col 2, line 5). The courts have held that "It is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose . . . [T]he idea of combining them flows logically form their having been individually taught in the prior art." *In re Kerkhoven*, 626 F.2d. 846, 850, 205 USPQ 1069, 1072 (CCPA 1980). In the present application, both carbon black and carbon fibrils are useful as conductive fillers. Therefore, the examiner takes the position that it would have been obvious to blend carbon black and carbon fibrils in semiconductive shield compositions because less carbon fibril is needed to reach the desired conductivity and the carbon fibrils increase the polymer's tensile and flexural characteristics whereas carbon black is relatively cheap (see '382, col 1, line 36).

3. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ongchin (Pat. No. 4,286,023) in view of Nahass et al. (Pat. No. 5,591,382). Ongchin teaches an article of manufacture comprising one or more strands of a conducting metal or alloy, a layer of semiconductive shielding, a layer of insulation and a layer of strippable semi-conductive composition. The strippable semiconductive material comprises (A) an ethylene copolymer selected from the group consisting of an ethylene-alkyl acrylate copolymer containing from about 15-45wt% acrylate or ethylene vinyl acetate containing 15-60wt% acetate, (B) a nitrile rubber containing 10-50wt% acrylonitrile, (C conductive carbon black, and (D) a peroxide crosslinking agent (col 2, lines 4-19). The ratio of (A) to (B) is between 9:1 and 1:9. The conductive carbon black is added in amounts of 10 to 150 parts per 100 parts of (A)+(B) (col 2, lines 19-26).

Ongchin does not teach that carbon fibrils (a.k.a. nanotubes) may be added to the semiconducting shield compositions. However, Nahass teaches that carbon fibrils have been used in place of carbon black in conductive compositions. Compared to carbon black, less carbon fibril is necessary to reach the desired conductivity. Furthermore, a polymer's tensile and flexural characteristics are enhanced when carbon fibrils are added (col 1, line 54- col 2, line 5). The courts have held that "It is prima facie obvious to combine two composition each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose . . . [T]he idea of combining them flows logically form their having been individually taught in the prior art." *In re Kerkhoven*, 626 F.2d. 846, 850, 205 USPQ 1069, 1072 (CCPA 1980). In the present application, both carbon black and carbon fibrils are useful as conductive fillers. Therefore, the examiner takes the position that it would have been obvious to blend carbon black and carbon fibrils in semiconductive shield compositions because less carbon fibril is needed to reach the desired conductivity and the carbon fibrils increase the polymer's tensile and flexural characteristics whereas carbon black is relatively cheap (see '382, col 1, line 36).

4. Claims 5, 7, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ongchin (Pat. No. 4,286,023) in view of Nahass et al. (Pat. No. 5,591,382), as applied to claims 1-4 above. Ongchin in view of Nahass is relied upon as above. However, neither reference teaches that relative amounts of carbon black and carbon fibrils that should be utilized together in a semiconducting shield composition. However, the courts have held that "When the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or

workable ranges by routine experimentation." *In re Aller* 220, F.2d, 44, 456, 105 USPQ 233, 235 (CCPA 1955). In the present situation, it would have been obvious to utilize carbon black and carbon fibrils as conductive fillers in the same composition. The examiner takes the position that it would have been obvious to optimize the amounts of carbon black and carbon fibrils in order to obtain the desired conductivity. Furthermore, it would have been obvious to one of ordinary skill in the art to vary the amount of carbon fibril with relation to the amount of carbon black in order to control the composition's tensile and flexural characteristics.

5. Claims 1, 6, 8, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ongchin (Pat. No. 4,286,023) in view of Silver et al. (Pat. No. 4,317,001) and Nahass et al. (Pat. No. 5,591,382). Ongchin teaches an article of manufacture comprising one or more strands of a conducting metal or alloy, a layer of semiconductive shielding, a layer of polyethylene insulation and a layer of strippable semi-conductive composition. The strippable semiconductive material comprises (A) an ethylene copolymer selected from the group consisting of an ethylene-alkyl acrylate copolymer containing from about 15-45wt% acrylate or ethylene vinyl acetate containing 15-60wt% acetate, (B) a nitrile rubber containing 10-50wt% acrylonitrile, (C conductive carbon black, and (D) a peroxide crosslinking agent (col 2, lines 4-19). The ratio of (A) to (B) is between 9:1 and 1:9. The conductive carbon black is added in amounts of 10 to 150 parts per 100 parts of (A)+(B) (col 2, lines 19-26).

Ongchin does not teach that the insulation layer should comprise conductive filler. However, Silver teaches an insulation layer for an electric cable wherein the insulative layer should have a volume resistivity of at least the order of 10^{10} ohm*cm. In order to obtain such a

resistivity, conductive particles (e.g., carbon black) may be added to the insulating composition in amounts of less than 2.5wt% (col 1, lines 18-41). Therefore, the examiner takes the position that it would have been obvious to add low amounts of a conductive particle to the polyethylene insulative layer taught by Ongchin in order to obtain the desired volume resistivity.

Neither Ongchin nor Silver teaches that a blend of carbon black and carbon fibrils (a.k.a. nanotubes) should be utilized as the conductive filler added to the insulating layer. However, Silver teaches the addition of carbon black conductive fillers to insulative layers and Nahass teaches that carbon fibrils have been used in place of carbon black as conductive filler. The courts have held that "It is prima facie obvious to combine two composition each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose . . . [T]he idea of combining them flows logically form their having been individually taught in the prior art." *In re Kerkhoven*, 626 F.2d. 846, 850, 205 USPQ 1069, 1072 (CCPA 1980). Since Nahass and Silver teach that both carbon black and carbon filbrils have been utilized equivalently as conductive filler, the examiner takes the position that it would have been obvious to blend carbon black and carbon fibrils in semiconductive shield compositions because less carbon fibril is needed to reach the desired conductivity and the carbon fibrils increase the polymer's tensile and flexural characteristics whereas carbon black is relatively cheap (see '382, col 1, line 36).

6. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0420271A1 (a.k.a. Burns et al.) in view of Nahass et al. (Pat. No. 5,591,382). Burns teaches an insulated electrical conductor comprising one or more strands of a conducting metal or alloy, a

layer of semiconductive shielding, a layer of insulation and a layer of strippable semi-conductive composition (page 2, lines 6-12). The strippable semiconductive material comprises (A) 40-65wt% an ethylene-vinyl acetate copolymer containing 27-45wt% acetate, (B) 5-30wt% nitrile rubber containing 25-55wt% acrylonitrile, (C 25-45wt% conductive carbon black, and (D) a peroxide crosslinking agent (page 3, lines 15-22).

Burns does not teach that carbon fibrils (a.k.a. nanotubes) may be added to the semiconducting shield compositions. However, Nahass teaches that carbon fibrils have been used in place of carbon black in conductive compositions. Compared to carbon black, less carbon fibril is necessary to reach the desired conductivity. Furthermore, a polymer's tensile and flexural characteristics are enhanced when carbon fibrils are added (col 1, line 54- col 2, line 5). The courts have held that "It is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose. . . [T]he idea of combining them flows logically form their having been individually taught in the prior art." *In re Kerkhoven*, 626 F.2d. 846, 850, 205 USPQ 1069, 1072 (CCPA 1980). In the present application, both carbon black and carbon fibrils are useful as conductive fillers. Therefore, the examiner takes the position that it would have been obvious to blend carbon black and carbon fibrils in semiconductive shield compositions because less carbon fibril is needed to reach the desired conductivity and the carbon fibrils increase the polymer's tensile and flexural characteristics whereas carbon black is relatively cheap (see '382, col 1, line 36).

7. Claims 5, 7, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0420271A1 (aka Burns et al.) in view of Nahass et al. (Pat. No. 5,591,382), as applied to claims 1-4 above. Burns in view of Nahass is relied upon as above. Neither reference teaches that relative amounts of carbon black and carbon fibrils that should be utilized together in a semiconducting shield composition. However, the courts have held that "When the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller* 220, F.2d, 44, 456, 105 USPQ 233, 235 (CCPA 1955). In the present situation, it would have been obvious to utilize carbon black and carbon fibrils in the same composition. Therefore, the examiner takes the position that it would have been obvious to optimize the amounts of carbon black and carbon fibrils in order to obtain the desired conductivity. Furthermore, it would have been obvious to one of ordinary skill in the art to vary the amount of carbon fibril with relation to the amount of carbon black in order to control the composition's tensile and flexural characteristics.

Response to Arguments

8. Applicant's arguments filed May 24, 2001 have been fully considered but they are not persuasive. Applicant argues that there is nothing that suggests the substitution of carbon black with nanotubes in semiconductive layers. The examiner respectfully disagrees. Nahass teaches that nanotubes may be added to shielding for electrical components (col 1, lines 13-17).

Applicant further argues that the use of carbon fibrils instead of carbon blacks improves the viscosity of the thermoplastic composition. However, Nahass recognizes that compositions

comprising carbon black are subject to breakdown during high shear melt processing. Thus, Applicant's arguments are not persuasive.

Applicant further argues that the same volume resistivity can be obtained with lower levels of nanotubes. However, Nahass recognizes that, compared to carbon black, less carbon fibril is necessary to reach the desired conductivity. Thus, Applicant's arguments are not persuasive.

Applicant also argues that the volume resistivity of carbon fibril-containing compositions have higher stability over thermal cycles. However, such an argument does not agree in scope with the claims. The examples all comprise a crosslinking agent, whereas the claims do not. Furthermore, the examples in the specification that comprise both nanotubes and carbon black also comprise a blend of LLDPE and ethylene/ethyl acrylate as the binder. The examiner also takes the position that the results are not unexpected because Nahass teaches a composition comprising nanotubes should be more structurally stable. Thus, applicant's arguments are not persuasive.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin R. Kruer whose telephone number is (703) 305-0025. The examiner can normally be reached on Monday-Friday from 7:00 a.m. to4:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau, can be reached on (703) 308-2367. The fax phone number for the organization where this application or proceeding is assigned is (703)305-5436.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0651.

K-R K

Kevin R. Kruer
Patent Examiner

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